



UNIVERSIDADE LUSÍADA
LISBOA

Course Unit Program
Digital Systems

Academic Year 2023/2024

1. Organic Unit

Faculty of Business and Economic Sciences

2. Course

Computer Engineering

3. Cycle

1st

4. Course Unit

Digital Systems (L9005)

5. Scientific Area

6. Curricular Year

1st

7. Type of Curricular Unit / Semester

1st Semester



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8. Class type and workload (work time)

Theoretical classes:

Practical classes:

Theoretical-Practical Classes 30,00

Tutorial Guidance: 20,00

9. ECTS Credits

6,00

10. Scientific Area Coordinator

11. Regent

Prof. Doutor PAULO JORGE GONÇALVES PINTO

12. Assistants

13. Teaching Language

Portuguese

14. General Objectives

Introduce the fundamentals of specification, analysis, design and design of digital logic circuits.

15. Specific Objectives

Master the mathematical bases of logical digital systems.

Master the specifications, analysis, design and construction of a digital logic system.

16. Skills to be acquired

Acquire skills that enable students to independently specify, interpret, design, design and implement digital logic systems.

17. Teaching Methodology

In a first phase, theoretical-practical classes of manipulation of the Mathematical model of Digital Systems, accompanied by Tutorial classes of application exercises.

In a second phase, theoretical-practical classes on the design and specification of digital logic systems, accompanied by laboratory tutorial classes for the physical implementation of the circuits.

18. Course Unit Program



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Numbering systems: Decimal system;
Base system b ;
Binary system; Binary/decimal/binary numeric conversion;
octal system; Numeric conversion octal/decimal/octal; Numeric conversion octal/binary/octal;
Hexadecimal system; Hexadecimal/decimal/hexadecimal numeric conversion;
Hexadecimal/octal/hexadecimal numeric conversion; Hexadecimal/Binary/Hexadecimal Numeric Conversion;
Addition algorithm in a base b , particularized for base two Representation of numbers in modulus and sign; Two's complement notation;
Codes: Natural Binary Code (CBN); Binary Coded Decimal Code (BCD); Grey's Code;
Logical functions: Truth tables; NOT function; AND function; OR function; NAND function; NOR function; XOR function; XNOR function;
Postulates of Boolean algebra; Boolean Algebra Properties;
Principle of duality; De Morgan's Laws; Precedence of logical operations; Minterms and maxterms; Disjunctive canonical form; Conjunctive canonical form;
Homomorphism between Boolean algebra and circuit diagrams.
Logical diagrams; Complete sets of logic gates; Simplification of functions Algebraic manipulation; Karnaugh Maps; Combinatorial circuits; Analysis of combinatorial circuits; Decoders; encoders; Multiplexer; Demultiplexer; Comparators; Adders; flip-flops.
Asynchronous circuits;
Design of combinatorial circuits;

19. Assessment Methods

For the Continuous Assessment, the following components are considered: (1) two written points, and (2) attendance in accordance with the RGAC in force.

20. Didactic Resources

Computers;
Digital Systems Laboratory

21. Sustainability Objectives

- 4. Quality Education
- 5. Gender Equality
- 9. Industry, Innovation and Infrastructure

22. Keywords

Digital systems
Logic circuits
Boolean Algebra
Karnaugh maps



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23. Main Bibliography

Author(s): Ronald J. Tocci, Neal S. Widner, Gregory L. Moss
Title: Sistemas Digitais - Princípios e Aplicações
Edition: 11^a Year: 2014
Local: São Paulo - Brasil
Publisher: Person

Author(s): Thomas L. Floyd
Title: Digital Fundamentals
Edition: 11th Year: 2015
Local: Essex - Harlow, England
Publisher: Person

Author(s): Carlos Sêrro
Title: Sistemas Digitais: Fundamentos Algébricos
Edition: 1^a Year: 2003
Local: Lisboa
Publisher: IST Press

24. Complementary Bibliography

Author(s): Alexander Axelvitch
Title: Digital Electronic Circuits - The Comprehensive View
Edition: 1^a Year: 2018
Local: UK
Publisher: World Scientific Publishing Co Pte Ltd

Author(s): A. Anand Kumar
Title: Fundamentals of Digital Circuits
Edition: 4^a Year: 2016
Local: Dehli - India
Publisher: PHI Learning



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Ficha técnica MIP / MIP Datasheet	
Título / Title	Course Unit Program 'SISTEMAS DIGITAIS': Academic Year 2023/2024
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Colaborador(es) / Colaborator(s)	-
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